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Financial Regulation and Performance

Cross-Country Evidence

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Those who believe stricter restrictions on allowable bank activities will limit risk-taking behavior may be surprised to learn that in countries where bank activities are restricted, the likelihood of a banking crisis may be greater.

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Summary findings

Costly bank failures in the past two decades have focused attention on the need to find ways to improve the performance of different countries' financial systems. Belief is overwhelming that financial systems can be improved but there is little empirical evidence to support any specific advice about regulatory and supervisory reform. With scant cross-country comparisons of financial regulatory and supervisory systems, economists cannot decide how to correct incentives and moral hazard problems in developing economies — whether, for example, to require higher (and more narrowly defined) capital-to-asset ratios, to mandate stricter definition and disclosure of nonperforming loans, to require that subordinated debt be issued, or to install world-class supervision. Proposed reforms usually involve changes in financial regulations and supervisory standards, but many pressing questions about reform remain unanswered.

Making use of a new database, Barth, Caprio, and Levine come up with brief answers to three key questions:

- Do countries with relatively weak governments and bureaucratic systems impose harsher regulatory restrictions on bank activities? *Yes.*
- Do countries with more restrictive regulatory regimes have poorly functioning banking systems. *No— or at least the evidence is mixed.*
- Do countries with more restrictive regulatory systems have less probability of suffering a banking crisis? *No. In fact, the reverse is true.* In countries where banks' securities activities are restricted, the likelihood of a banking crisis is greater, other things being equal.

This paper — a product of Finance, Development Research Group — is part of a larger effort in the group to study the effect of financial regulation and supervision. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Agnes Yaptenco, room MC3-446, telephone 202-473-8526, fax 202-522-1155, Internet address ayaptenco@worldbank.org. The authors may be contacted at gcaprio@worldbank.org or rlevine @worldbank.org. January 1999. (36 pages)

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FINANCIAL REGULATION AND PERFORMANCE: CROSS-COUNTRY EVIDENCE

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I. Introduction

The unprecedented number of costly bank failures throughout the world in the last two decades of the twentieth century has focussed attention on the need to determine more appropriate ways to improve upon the performance of different country's financial systems. Indeed, a substantial literature is already emerging on the causes and consequences of financial – mostly banking – crises, and on various reforms that might help prevent future crises.[1] Although the proposed reforms differ in important respects, nearly all include changes in existing financial regulations and supervisory standards. This central core of agreement is certainly understandable insofar as the financial crises in countries ranging from the United States and Japan, to Korea and Mexico, to Chile and Thailand, to India and Russia, and to Ghana and Hungary have been blamed at least in part on "bad" regulation and supervision.

In response to this recent and troubling situation, the World Bank, International Monetary Fund, and other international financial institutions are attempting to promote financial stability and economic development by more vigorously urging countries to adopt and then to implement appropriate regulations and supervisory practices for their financial sectors. The World Bank, for instance, in virtually all its financial sector reviews and projects now stresses more than ever the importance of prudential regulation and supervision. The overwhelming belief is that many countries can significantly improve upon their existing financial systems, thereby reducing the likelihood of financial instability and facilitating long-run economic growth.[2] More generally, there appears to be a universal belief among those who have studied these issues that

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[1] See, for example, Bank for International Settlements (1998); Barth, Brumbaugh, Ramesh, and Yago (forthcoming); Caprio (1998); Caprio and Klingebiel (1996, 1997); Demirguc-Kunt and Detragiache (1997, 1998); Garcia, Lindgren and Saal (1996); Goldstein and Turner (1996); Goldstein (1998); and Radelet and Sachs (1998).
[2] See Cull (1997).

inappropriate regulations and supervisory standards in a country not only retard its long-run economic growth but also increase the likelihood of a financial crisis that could spread beyond the country's own borders.

Despite all the agreement on the need for financial reform, however, remarkably there is relatively little empirical evidence to support any advice regarding specific and comprehensive regulatory and supervisory reforms. The reason for this awkward situation is that detailed cross-country comparisons of financial regulatory and supervisory systems for developing countries do not yet exist.[3] Without such information economists have nonetheless been able to conclude that incentives are critical in understanding the behavior of the different agents comprising the financial sector. In this regard, it is now recognized that the moral hazard problem has become more widespread and hence explains in part the recent worldwide outbreak in banking crises.[4] Economists have not yet been able to reach a conclusion, however, about the most appropriate way to correct the incentive and moral-hazard problems for banks, such as by requiring higher (and more narrowly defined) capital-to-asset ratios, mandating stricter definition and disclosure of nonperforming loans, requiring that subordinated debt be issued, or installing "world-class" supervision.

The inability to reach a conclusion about specific ways to resolve these serious problems is not surprising insofar as data on the practices of various financial regulatory and supervisory authorities for a wide of range countries have not been assembled and analyzed. This lack of information is quite important because it means that current efforts in reforming financial

[3] Barth, Nolle and Rice (1997) provide fairly detailed comparative information on the bank regulatory and supervisory systems for the 19 G-10 and European Union countries. They provide relatively little analysis, however, on the appropriate reforms to these systems.

[4] More generally, the moral hazard problem when not contained gives rise to an inefficient allocation of resources.

regulation and supervision are occurring without even the knowledge as to whether or under what circumstances these efforts will be successful. One should realize, moreover, that in situations in which supervisors' salaries are 5 to 10 percent of those of the 'supervisees,' or in which individuals can easily move (and usually with ample financial gain) from careers as regulators to careers with firms being regulated, reform efforts are unlikely to be truly successful.

To be more concrete about the lack of financial regulatory and supervisory data, even information on the extent to which banks in different developing countries are allowed to and actually do engage in various securities, insurance, and real estate activities has not yet been compiled and analyzed. Nor is there systematic compilation and analysis of information on whether banks can own or be owned by nonfinancial firms for a broad cross-section of countries. Yet, the extent to which these specific banking activities or banking and commerce inter-relationships inhibit or promote the development of an efficient and stable financial system or increase or decrease the likelihood of a banking crisis is largely unknown without such compilations and analyzes. In short, many important and pressing questions regarding the appropriate way to reform financial sector regulation and supervision in many countries throughout the world cannot currently be adequately answered.

Research on these types of issues, therefore, is of critical importance because it will enable one to identify better the particular mix of regulations and supervisory standards that promote well-functioning financial systems. Based upon this identification one then is in a position to provide better guidance to policymakers on appropriate financial sector reforms. Already, ongoing research is significantly improving our understanding of the broad relationships between the type of legal system existing within a country and its financial sector

development.[5] The somewhat narrower research being discussed here complements this other work.

This paper specifically focuses on the regulation and supervision of the banking sector.[6] Efforts to collect detailed and comprehensive information on the different financial regulatory and supervisory environments that exist in the approximately 185 countries throughout the world are just beginning, and at present only partial information is available for about 50 countries. Given this situation, we make use of the information that is available. Fortunately, the recently obtained data includes the degree to which regulatory restrictions are imposed on several important and even controversial activities of banks. This newer information, together with that previously gathered, enables us to examine empirically for the first time, albeit in a preliminary manner, the inter-relationships among some important regulatory, governmental, and financial variables.

More specifically, the following three questions are examined – with brief answers to them – in this paper :

(1) Do countries with relatively weak government/bureaucratic systems impose harsher regulatory restrictions on activities of banks? Answer: yes.

(2) Do countries with more restrictive regulatory systems have poorly functioning banking systems? Answer: no, or at least the evidence is mixed.

(3) Do countries with more restrictive regulatory systems have a lower probability of suffering a banking crisis? Answer: no; in fact, the results indicate the opposite to be the

[5] See La Porta, Lopez de Silanes, Shleifer and Vishny (1997, 1998), Levine (1997), and Levine, Loayza, and Beck (1998).

[6] It should be noted, however, that in many developing and emerging market economies, the banking sector is the most important component of the financial system.

case. In countries in which the securities activities of banks are restricted, the likelihood of a banking crisis is greater, *ceteris paribus*.

The third finding contradicts those who believe that stricter restrictions on the allowable activities of banks constrains excessive risk-taking behavior, partly by making them easier to monitor by both the supervisory authorities and market participants.[7] There are two possible forces that may be at work to produce such a result. First, to the extent that narrower banking activities (e.g., making loans) and broader financial activities (e.g., engaging in securities and insurance activities) are not highly and positively correlated, banks in countries allowing broader powers are able to benefit by being more diversified in their operations. This reduces the likelihood of both failures and crises.[8] Second, Hellmann, Murdoch and Stiglitz (1998) demonstrate that by imposing one specific restriction – deposit interest rate ceilings -- on banks one may obtain a more robust banking system, mainly because of higher franchise value resulting from the restriction. Our findings, however, indicate that harsher restrictions on those banks' activities considered here likely lower franchise value, either by limiting profits (reducing economies of scale and scope) or by increasing the variability of profits (leaving average profits unchanged but reducing the market value of those profits to the extent that investors prefer less to more volatility).[9] This means that reducing, if not totally eliminating, these restrictions would allow greater diversification and thereby enhance franchise value. This regulatory reform, in

[7] In the case of the U.S. savings and loan debacle, despite the fact that unitary thrift holding companies had comparatively few restrictions on their activities, including the mixing of banking and commerce, these broader powers were not found to be a significant factor in the debacle. See, for example, Barth (1991).

[8] See Caprio and Wilson (1997) for evidence identifying a link between a lack of diversification and bank failures in selected countries.

[9] Bankers frequently lament that restrictions on their ability to engage in investment banking activities excludes them from more profitable lines of business. However, it should not be the case, at least in the long run, that one sector has a consistently higher profit rate than another, other things equal. For this reason, the economies of scale and scope argument is more persuasive with respect to eliminating the restrictions.

turn, would induce more incentive compatible behavior on the part of banks.[10] The gain from allowing broader banking powers appears to more than offset whatever added complications such a move towards "universal banking" would imply for monitoring. [11]

These empirical results, of course, are preliminary. A more extensive dataset will be assembled to permit an analysis of a wider variety of regulatory issues. An attempt will also be made to obtain indicators of the supervisory authorities' and markets participants' ability to monitor banks. The database, moreover, will be expanded beyond the 50 countries in our sample, thereby increasing the power of the empirical tests.

Despite the preliminary nature of these results, they do seem sufficiently robust that policy makers should consider them, along with the results of other recent work on banking crises, in deciding upon the most appropriate way in which to reform bank regulation. More specifically, this and other recent research suggests that there are several initial steps that could be taken to reduce significantly the likelihood of banking crises. Countries could, among other things, develop and improve legal systems and information disclosure (see Demirguc-Kunt and Detragiache (1997, 1998)); impose rate ceilings on bank deposits (see Hellmann, Murdoch, and Stiglitz (1998)); establish limits either on the rate at which banks can expand credit or on the rate of increase in their exposure to certain sectors, such as real estate (see Caprio, Atiyas, and Hanson (1994) and Barth, Brumbaugh, Ramesh and Yago (1998)); require greater diversification of bank portfolios (see Caprio and Wilson (1997)); and, based upon the results reported in this paper, reduce the restrictions on the range of activities in which banks can engage. Determining which combination of these recommendations are most appropriate for individual countries that

[10] Some argue, moreover, that bank ownership of nonfinancial firms may improve corporate governance.
[11] Based upon an empirical analysis, Puri (1996) concludes that universal banks are better than investment banks at

are at different stages of development should be the subject of future empirical research.

The remainder of the paper proceeds as follows. Section II reviews some of the recent literature on the relationship between bank regulation and supervision and banking sector performance, and the reasons this relationship is a subject of considerable and sometimes heated debate.[12] Section III essentially provides a progress report on the linkages that are found between bank regulatory restrictiveness, or more accurately the degree to which there are limits on bank allowable activities, and bank performance. Lastly, Section IV summarizes some issues to be addressed in future research.

II. Regulation and Performance: Some Issues

All the attention currently being given to the role of government in the financial sector – its participation as owner of financial intermediaries, its intervention in pricing and allocating credit, and its role in regulating and supervising financial intermediaries – is not surprising in view of recent events around the world. Yet, for decades the size, composition and functioning of the financial system were generally considered to be unimportant for economic development and growth, and therefore usually omitted from standard macroeconomic models and development texts.[13] This neglect of the financial system enabled governments more easily to use it for their own and sometimes relatively narrow purposes. In many developing countries, for example, collecting taxes, issuing government debt at low cost, and allocating subsidized credit to accomplish various government goals were the primary tasks assigned to the financial system.

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underwriting securities.

[12] In March 1997, for instance, U. S. House Banking Committee Chairman James Leach said that "Mixing commerce and banking simply doesn't fit our kind of democracy". See Barth, Brumbaugh, and Yago (1997, p.47).

[13] Given the focus of this paper, Freixas and Rochet (1998), moreover, state "that a microeconomic theory of banks could not exist before the foundations of the economics of information were laid (in early 1970)...."

The resulting and severe financial repression in countries operating their financial systems in this way was a widely recognized sign of failure. The response was greater financial liberalization beginning in the industrial countries and in a few developing countries in the 1970s – in the former group the degree of financial repression had been negligible -- and spreading more broadly in the 1980s and 1990s.

The trend towards more liberalized financial systems, however, has not been the only development. More than 130 countries have suffered from exceptionally costly episodes of banking problems in the past two decades, culminating in the financial crisis in East Asia in 1997-1998. Indeed, the costs to resolve bank failures have amounted to 10, 20, and even 30 percent of GDP in various countries in recent years.[14] Current attention is focused mainly on Japan, where the nonperforming loans of banks in 1998 are estimated to be as high as $1 trillion , with associated losses amounting to 40 to 50 percent of this figure according to some press reports.

Based upon these recent and disturbing developments, it is quite understandable that the government's role vis-a-vis the financial system is receiving unprecedented attention throughout the world. It has long been established that every government will be significantly involved in the money supply process and, in particular, in assigning lender of last resort responsibilities to a central bank.[15] The involvement of governments in the financial system in nearly all countries has expended beyond these areas, however. Most recently, for example, governments in many countries have been establishing explicit deposit insurance schemes. Overwhelmingly,

[14] See Caprio and Klingebiel (1997, p. 80 and 1996, p. 15) and Lindgren, Garcia, and Saal (1996, p. 30).
[15] In this regard, see the discussion of free banking in Freixas and Rochet (1998, pp. 260-265)

governments have centered on the banking sector for substantial involvement.[16] But non-banking institutions have also received growing attention since the adoption of auditing and disclosure standards by British authorities over 100 years ago and the subsequent growth in securities market activity.

Bank regulation used to be relatively straightforward: authorities simply decided whether or not to grant charters, to limit geographical expansion, to prescribe some activities (e.g., holding government securities), and to proscribe others (e.g., fraud). Apart from these kinds of regulations, banks were largely self-regulating. But even these relatively few regulations were not always entirely benign. In the U.S., for example, banking failures were more widespread in the nineteenth century than in other countries due mainly to limits on intrastate and interstate branching.[17] These limits on geographical expansion led to more bank failures than would have otherwise occurred. In effect, this adverse outcome was due to faulty regulation, namely the restriction on the ability of banks to diversify their loan portfolios geographically.[18]

Bank failures occurred elsewhere, of course, but in those states in which banks were allowed to branch and belonged to clearinghouses, there was better diversification and greater cooperation to protect banks against loan losses. This combination provided more appropriate incentives for bankers, and in some cases private bank supervision (with financial incentives for supervisors), which helped keep failure rates low even during recessions. Moreover, bank failure

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[16] There is disagreement, however, as to whether the central bank, a separate agency, or some combination thereof should regulate and supervise banks.

[17] Some states even limited banks to a single office, and were known as unit banking states.

[18] A Dutch banker's maxim from earlier times was the 'watchtower' theory in which banks should only lend as far as they could see from the top of the watchtower in the center of town. The reason is that such loans would bear risks that they understood best. However, geographical diversification of lending proved to be even more important, as the failure of unit banks (i.e., banks in states permitting only a single office) seems to indicate. Similarly, a major factor in the U.S. savings and loans debacle was poor regulation, in the form of the restriction that institutions make long-term, fixed-rate home mortgage loans that were funded with shorter-term deposits.

rates in these types of states (as in Canada, which allows nationwide branching) were significantly lower than those in the most restrictive branching states.[19] And as Benston et al (1996) point out, moreover, the bank failure rate during 1875-1919 was lower than the corresponding rate for nonfinancial firms.

Yet, regardless of the fundamental causes of bank failures, the view that banking should be largely self-regulated was unlikely any more popular in the early 1870s – when what used to be called the Great Depression began with a financial crisis reminiscent of the East Asia financial crisis in 1997 (see De Long (1998)) – than in the 1930s when the entire U.S. banking system collapsed. Indeed, few governments are willing to let the banking system suffer a 'systemic' run, or even to allow any of the largest banks to close, with the latter situation creating the 'too-big-to-fail' problem.[20] When a country's banking system suffers a systemic run, or when insolvent banks are allowed to remain open without any overt run, the adverse impact on the economy is substantial. In the case of widespread bank insolvency, even without a run, the credit system typically grinds to a halt and unprofitable firms are usually able to roll over their loans resulting in a lack of funds for worthwhile investment projects and an inefficient allocation of capital. In the case of widespread bank runs both the payments and credit systems collapse, with the economy turning to barter and standards of living plummeting further.[21] Residents of East Asia, including Japan, are currently discovering the direct and dire consequences of a malfunctioning credit system, while Indonesia also experienced temporary runs on its banks.

Furthermore, restrictions prevented them from hedging the resulting interest rate risk.

[19] See Calomiris (1992), Gorton and Mullineaux (1987), and Bordo (1997).

[20] See Baer and Klingebiel (1995) for a discussion of and evidence on the favorable outcomes than result when depositors are allowed to incur losses from bank failures.

[21] The payments system may not collapse with insolvent banks remaining open but not experiencing runs. If interbank exposures are covered by implicit or explicit deposit insurance, than the payments system will likely continue to function. When interbank exposures are not covered, solvent banks will curtail and avoid exposure to

Even proponents of laissez-faire admit that if they held policy-making positions during a crisis affecting large banks, they most likely would ignore their own advice that no bank is too big to fail. This situation suggests that perhaps one should consider a framework for financial regulation in which one set of rules would operate during normal times, and which would be designed to minimize the likelihood of a financial crisis, and another set of rules would operate when a crisis emerges.[22] Except at the level of generalities – like Bagehot's rule to 'discount freely and at a penalty rate' -- the set of rules governing a crisis would unlikely be specific, so that its effect both on financial sector development and on the occurrence of a financial crisis is problematic.

The design of an appropriate regulatory environment during normal times, however, is more tractable. Nevertheless, the issue is certainly not simple. The existence of information asymmetries, coupled with intertemporal transactions, introduce complexities into a financial system. Indeed, without problems of incomplete and imperfect information a financial system would be easy to regulate because it would be quite trivial. But this is not the case. Banks are therefore quite difficult to regulate: information problems affect all participants, whether they be creditors, shareholders, senior bank managers, or even regulators.

A consensus does appear to be emerging that due to the inherent difficulty in monitoring financial intermediaries the regulatory environment needs to change in such a way that there will be several 'watchful eyes,' meaning participants in the financial marketplace with information about banks available to them and the incentives to act on it. Some countries have already found merit in this approach and operationalized it. Argentina, for example, has increased capital

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insolvent banks, thereby impeding the efficient operation of the payments system.

[22] See Brock (1998) for a discussion of the transition.

requirements and set a minimum that is tied to indicators of credit and market risk; required banks to issue subordinated debt; strengthened accounting and disclosure requirements; mandated external bank audits ; and, more generally, improved supervision. Collectively, these reforms in bank regulation mean that owners, creditors, and supervisors are more likely to monitor banks effectively.

Although the general direction in which many countries need to move with respect to banking reforms is clear, the appropriate mix of all the different components of regulation and supervision is only now becoming a subject of research. For a relatively few countries, some attempts have been made to provide a comparative ranking of selected features of bank regulation.[23] There is some indication, though necessarily significantly qualified due to limited data availability, that a tighter regulatory environment – one with tougher capital and liquidity standards, stricter definitions of capital and nonperforming loans, more widespread mandatory provisioning once a loan is nonperforming, a greater presence of foreign banks, and a more transparent and better operating environment -- will help banking systems survive crises.

Another important aspect to regulation that has received even less attention recently, and one which the next section attempts to address, concerns the allowable activities of banks. For example, do banks that are allowed to engage in financial activities beyond less-traditional commercial banking activities – such as securities underwriting and dealing, insurance underwriting and brokerage, real estate investment and development and nonfinancial firm ownership and control – intermediate more efficiently, and are they less prone to a financial crisis? The answer is not clear. Proponents of the separation of commercial and investment banking in the U.S. during the 1930s argued that there are inherent conflicts of interest between

the two businesses, not withstanding the fact that anything other than "arm's length" transactions would be bad for business over the long term. Kroszner and Rajan (1994), however, find no empirical evidence to support the view that problems arise because of the potential conflict of interest.

Furthermore, White (1986), among others, maintains that universal banks may be better diversified, and hence more stable. Yet, some bank supervisors argue that combining traditional and nontraditional activities makes banks harder to supervise by the regulatory authorities. In addition, Rajan (1998) suggests that allowing banks to engage in a wide range of activities increases the difficulty of monitoring by market participants. The implication of this view is that harder-to-monitor banks are more likely to pose problems. Indeed, Rajan more generally urges emerging market countries that are considering universal banking to proceed cautiously, while also indicating there is a need for further empirical research in this area. This paper attempts to begin this research effort by investigating the impact of selected bank regulatory restrictions on various measures of performance, deferring to future research an assessment of the linkages between the broader regulatory environment and financial sector and, more generally, economic outcomes.

III. Regulatory Restrictions, Governmental Bureaucracy, and Banking Sector Performance

This section empirically examines the interrelationships among: (a) regulatory restrictions on the activities of banks, (b) the ability of government/bureaucratic systems to operate effectively, (c) the level of development and efficiency of the banking sector, and (d) the fragility of the banking system. This examination is based upon newly assembled data for a cross-section of 45

[23] See, for example, Caprio (1998), Ramos (1997) and JP Morgan (1997).

countries. Specifically, the following three questions are addressed:

1. Do countries with relatively weak government/bureaucratic systems -- *measured in terms of corruption, bureaucratic redtape, and the degree to which a country holds to the rule of law* -- impose harsher regulatory restrictions on the activities of banks -- *measured in terms of allowable securities activities, insurance activities, real estate activities, and ownership of nonfinancial firms*?
2. Do countries with relatively restrictive regulatory systems have poorer functioning banking systems -- *as measured by deposit money bank credit to the private sector relative to GDP, bank overhead expenditures relative to total assets, and net interest income relative to total assets*?
3. Do countries with relatively restrictive regulatory systems have lower probabilities of suffering a banking crisis -- *where a country is deemed to have had a crisis if the estimated losses from bank failures are greater than five percent of GDP*?

Cross-country evaluations of national regulatory regimes form the basis for answering all three questions. The first subsection describes our assessment of the restrictiveness of national regulatory systems. The second subsection discusses measures of government/bureaucratic systems. The subsequent subsections contain the evidence pertaining to each of the three questions.

A. Regulatory Restrictions on Bank Activities

This paper constructs quantitative data on allowable nontraditional activities of banks using information from Barth, Nolle, and Rice (1997), Kyei (1995), Akamatsu (1995) the Institute of International Bankers (Global Survey-various years), Euromoney (Banking Yearbook 1995), and various central bank and government sources. It is this data that forms the basis for the assessment of the restrictiveness of national regulatory systems.

The empirical analysis is specifically based upon the degree to which a country's regulatory system allows banks to engage in the following four nontraditional activities:

- **Securities**: the ability of banks to engage in the businesses of securities underwriting, brokering, dealing, and all aspects of the mutual fund business.
- **Insurance**: the ability of banks to engage in insurance underwriting and selling.
- **Real Estate**: the ability of banks to engage in real estate investment, development and management.
- **Nonfinancial Firm Ownership**: the ability of banks to own and control nonfinancial firms.

Based upon the analysis of available documents, each country's regulations concerning these nontraditional activities has been assessed. These assessments are used to assign a number between one and four to each activity – Securities, Insurance, Real Estate, and Nonfinancial Firm Ownership – that indicates the degree of regulatory restrictiveness for that activity in each country. The assigned numbers are interpreted as follows:

1 -- indicates "unrestricted": banks can engage in the full range of the activity directly in the bank.

2 -- indicates "permitted": the full range of those activities can be conducted, but all or some of the activity must be conducted in subsidiaries.

3 -- indicates "restricted": banks can engage in less than full range of to activity , either in the bank or subsidiaries.

4 -- indicates "prohibited": the activity may not be conducted by the bank or subsidiaries.

The numerical scores assigned to each of the four activities for the countries in our sample are summarized in Appendix Table 1. A summary index is also computed for the overall regulatory restrictiveness of all four activities of banks. Specifically, RESTRICT equals the average value of Securities, Insurance, Real Estate, and Nonfinancial Firm Ownership, so that RESTRICT takes on values between 1 (least restrictive) and 4 (most restrictive). The average value of RESTRICT is 2.2, with a standard deviation of 0.6. There are five countries with very restrictive regulatory systems (RESTRICT > 3): Chile, Ecuador, Indonesia, Japan, and Peru. There are six countries with very permissive systems (RESTRICT < 1.5): Austria, Israel, Malaysia, Sri Lanka, Switzerland, and the United Kingdom. The United States has a value of 3.

These data on regulatory restrictiveness clearly involve some degree of subjectivity. As more detailed and comprehensive information becomes available, we will therefore update the data and the results that follow. Nonetheless, the currently available data and the approach taken provide new and useful –though certainly not unassailable – information regarding the interrelationships among regulatory regimes, government/bureaucratic systems, banking sector development and especially banking sector fragility.

B. Government/Bureaucratic Systems

Information about the effectiveness of government/bureaucratic systems is used for two reasons. First, the paper seeks to assess the relationship between the quality of the governmental bureaucracy and the restrictiveness of the regulatory regime. To perform such an assessment one needs quantitative measures regarding the manner in which the government operates. Second,

the paper seeks to assess the relationship between the restrictiveness of the regulatory regime and both banking sector development and the fragility of the banking system. To make this assessment, one needs to control for other factors. Specifically, one needs to control for the overall effectiveness of the government/bureaucratic system to determine the extent to which there is an independent link between a country's regulatory restrictiveness and its banking sector development and the fragility of its banking system. For these reasons measures of the way in which a government/bureaucratic system functions are used in conducting our analyses.

Numerous measures of the functioning of the government were considered, but the focus is on the following three:

> **REDTAPE**, which represents an assessment of the degree to which the governmental bureaucracy is an obstacle to business. Higher values of REDTAPE represent *less* redtape, and a *more* smoothly functioning bureaucracy.[24] REDTAPE takes on values between 1 and 10.
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> **CORRUPT**, which represents an assessment of corruption in government. Higher values of CORRUPT indicate high government officials are *less* likely to demand special payments for performing various services and signify that illegal payments are generally *less* common throughout government. CORRUPT takes on values between 1 and 10.
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> **RULELAW**, which represents an assessment of the law and order tradition in the country as determined by the *International Country Risk Guide*. Higher values of RULELAW indicate that a country adheres to the rule-of-law to a greater degree than countries with lower values. RULELAW takes on values between 1 and 10.[25]

In addition, we consider **GOVERNMENT**, which is a composite index of the quality of the government/bureaucratic system, and equals the average value of Redtape, Corrupt, and Rulelaw. This means that higher values of GOVERNMENT indicate better functioning governments. The average value of GOVERNMENT for the countries in our sample is 7.0, with a standard

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[24] Data for REDTAPE are obtained from the *Business International Corporation* and cover the early 1980s. For more information, see Mauro (1995).

[25] Data for CORRUPT and RULELAW cover the period 1982-1995 and are taken from LaPorta, Lopez-de-Silanes,

deviation of 2.3. There are three countries with values of 10 for GOVERNMENT: the Netherlands, New Zealand, and Switzerland. The United States has a value of 9.3, while Chile has a value of 7.2. There are six countries with values below 4, indicating very poor government/bureaucratic systems: Colombia, Egypt, Indonesia, Nigeria, Pakistan, and the Philippines. It is also worth noting that other measures of the government/bureaucratic system were considered, including (a) assessments of the risk of government repudiation of contracts, (b) assessments of the risk of government expropriation of private poverty, and (c) assessments of the efficiency of the judiciary system. Incorporating these alternative indicators into the analyses does not change any of the results that follow, however.

C. *Regulatory Restrictiveness and Quality of Government/Bureaucratic System*

This subsection addresses question 1: Do countries with relatively weak government/bureaucratic systems impose harsher regulatory restrictions on the activities of banks?

Table 1-A shows that countries with better government systems (higher values of GOVERNMENT) on average have less restrictive regulatory systems (lower values of RESTRICT). The negative relationship between better government and regulatory restrictions is strongest for REAL ESTATE and NONFINANCIAL FIRM OWNERSHIP.[26] Table 1-B shows that these findings remain unchanged even after controlling both for the level of economic development and for political stability.[27] Thus, countries with better functioning governments – *countries with less redtape, less corruption, and a strong rule-of-law* – on average allow banks

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Shleifer, and Vishny (1998), who obtained the data from the *International Country Risk Guide*

[26] It should be pointed out that we also examined accounting standards. The correlation between accounting standards and regulatory restrictiveness is -0.44, with a P-value of 0.005, and the relationship remains significant at the 0.01 significance level after controlling for GDP per capita and measures of political stability.

[27] To measure the level of economic development, the logarithm of real per capita GDP is used. Political instability

the opportunity to provide their customers a wider array of nontraditional services.[28]

These findings suggest it is possible to substitute among different government mechanisms for overseeing bank behavior. This is consistent with recent work on legal systems. LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998), for instance, find that countries with legal systems that impede minority shareholders from exerting their rights are more likely to introduce mandatory dividends. Our findings indicate that countries with weak governments – that is, governments that are less likely to (a) supervise banks approximately or (b) create proper incentives for private sector participants to supervise banks – also on average impose harsher restrictions on the activities of banks.[29] Of course, there is a possibility that a third factor may be responsible for both effects. Political constraints, for instance, may prevent a government from both improving the operation of the bureaucracy and relaxing regulatory restrictions on the activities of banks.

D. *Regulatory Restrictiveness and Banking Sector Development and Efficiency*

This subsection addresses question 2: Do countries with more restrictive regulatory systems have poorly functioning banking systems -- *as measured by deposit money bank credit to the private sector relative to GDP, bank overhead expenditures relative to total assets, and net interest income relative to total assets*?

To asses the relationship between regulatory restrictiveness and banking sector development and efficiency, the following commonly used measures of the latter two variables

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is a measure of revolutions and coups obtained from Banks (1994).

[28] These results also hold for the individual components of GOVERNMENT.

[29] We currently are in the process of collecting more detailed information on supervisory systems, which will permit a more precise evaluation of this hypothesis.

are used:

- PRIVATE CREDIT, which is deposit money bank credit to the private sector relative to GDP.
- OVERHEAD, which is bank overhead expenditures relative to total assets.
- NET INTEREST, which is net interest income relative to total assets.[30]

Levine (1998) and Levine, Loayza, and Beck (1998) find that PRIVATE CREDIT exerts a causal and positive impact on long-run economic growth. Demirguc-Kunt, Levine, and Min (1998) find that OVERHEAD is also closely associated with more rapid economic growth in a broad cross-section of countries. Many researchers, moreover, use various indicators of interest rate margins, such as NET INTEREST, to assess banking sector efficiency.[31]

Table 2 presents mixed results regarding the relationship between the degree of regulatory restrictiveness and banking sector development and efficiency. While countries with more restrictive regulations on average have less bank credit, greater overhead expenditures, and larger net interest income, the correlations are not very robust. For instance, even though RESTRICT and PRIVATE CREDIT are significantly negatively correlated, this relationship breaks down when one controls for the level of economic development and political stability. Similarly, of the regulatory restrictiveness indicators, OVERHEAD is significantly correlated only with NONFINANCIAL FIRM OWNERSHIP, but even this relationship becomes insignificant when one controls for the level of economic development and political stability. Greater regulatory restrictiveness does remain positively correlated with NET INTEREST,

[30] PRIVATE CREDIT is from Levine, Loayza, and Beck (1998). It is an average over the period 1980-1995. Also, see Levine (1998). OVERHA and NET INTEREST are from Demirguc-Kunt, Levine, and Min (1998). The underlying data consist of stems from individual financial statements provided by BankScope and are averaged over the period 1985-1995.

[31] See, for example, Claessens, Demirguc-Kunt, and Huizinga (1997).

however, even when one controls for these other factors. Yet, this result mainly runs through REAL ESTATE and NONFINANCIAL FIRM OWNERSHIP. The finding may therefore be simply due to the fact that harsher restrictions on REAL ESTATE and NONFINANCIAL FIRM OWNERSHIP cause total assets of the banking sector to be less than otherwise, thereby increasing NET INTEREST. The relationship may, in other words, have nothing to do with interest rate spreads per se.[32] Thus, one must conclude that there is not a reliable and direct link between the degree of regulatory restrictiveness and widely used measures of banking sector development and efficiency.

E. *Regulatory Restrictiveness and Banking Crises*[33]

This subsection addresses question 3: Do countries with more restrictive regulatory systems have a lower probability of suffering a banking crisis?

To assess the impact of regulatory restrictiveness on banking sector fragility, two measures of whether a country's banking system suffered a crisis during the last 15 years are used. First, a country is considered to have experienced a crisis when the estimated losses to the government due to banking sector problems were greater than 5 percent of GDP. Second, to provide a more general indicator of fragility, a country is considered to have experienced a crisis when the banking system was judged to be insolvent, even though eventual losses were less than 5 percent of GDP. Since both indicators produce similar results, only results based upon the first measure are reported here; that is, a country is considered to have experienced a crisis when the estimated losses were greater than 5 percent of GDP.

[32] Unfortunately, the BankScope data that available to us do not have interest rate spreads; it has only interest income and interest expenses.

The empirical results indicate there is a positive relationship between the degree of regulatory restrictiveness -- especially restrictions on the securities activities of banks -- and banking sector fragility. The relationships between banking crises and both the government/bureaucratic system and regulatory environment are examined using both simple correlations and probit regressions. Table 3 presents the results based on the correlations. As may be seen, there is a positive link between banking sector crises and the stringency of the restrictions on banks' activities in the securities market business. Also, there is a significantly negative correlation between banking sector crises and good government/bureaucratic systems.

The empirical results based upon the Probit regressions support the contention that countries restricting the securities activities of banks have significantly higher probabilities of suffering a banking crisis than countries allowing banks greater freedom to engage in these activities. Table 4 presents the results based on the Probit regressions. The dependent variable is a dummy variable called CRISIS, where CRISIS equals 1 if a country suffered a banking crisis and CRISIS equals 0 otherwise.

In the probit regressions, a wide array of control variables are included to more accurately assess whether there is an independent link between banking crises and the degree of regulatory restrictiveness on the activities of banks. In particular, we control for the quality of both the government/bureaucratic system and accounting standards since a close connection is observed between poor government systems, poor accounting standards, and harsher regulatory restrictiveness. Importantly, it is found that there is a significant link between the harshness of bank securities restrictions and the likelihood of a banking crisis even after controlling for these institutional factors. We also control for the degree to which legal codes emphasize the rights of

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[33] This subsection builds on Barth, Caprio, and Levine (1998).

secured creditors and minority shareholders, since the contracting environment may influence incentives facing bank managers and pressures for regulatory interventions. Even after controlling for these legal characteristics, however, the findings still indicate that greater restrictions on the securities activities of banks produce a significantly higher probability of a banking crisis.

As an additional check on the robustness of this finding, we control for the overall level of economic development and the development of the financial system by including measures of the level of GDP per capita, the recent economic growth rate, and the size of the banking system. After controlling for these economic and financial development indicators, the legal characteristics, and the institutional variables, the results still indicate that countries restricting the securities activities of banks have significantly higher probabilities of suffering a banking crisis than countries with less restrictive regulatory practices. Furthermore, an attempt was made to control for bank franchise value by including measures of: (a) the net interest income of banks (NET INTEREST MARGIN) and (b) the concentration of the banking sector, which equals the percentage of total banking system assets accounted for by the five largest banks. Again, the findings remain unchanged -- a positive and statistically significant relationship between the harshness of the restrictions on the securities activities of banks and a banking sector crisis exists.[34]

There may be concerns about endogeneity. Countries with a fragile banking system may adopt restrictive banking sector regulations. Thus, the Table 4 Probit results may suffer from

[34] We also included a dummy variable indicating whether a country has an explicit deposit insurance scheme since Demirguc-Kunt and Detragiache (1997, 1998) find that deposit insurance regimes are positively associated with banking crises. The inclusion of this variable does not change our findings regarding regulatory restrictions on bank securities activities.

simultaneity bias. To control for potential simultaneity bias, we use a two-step instrumental variable estimator.[35] We tried a number of different instrumental variables. Here, we report the results using the legal origin of each country as an instrumental variable for regulatory restrictiveness. Legal scholars show that much of the world can be divided into countries with either a English, French, German, or Scandinavian legal heritage. Since legal heritage was determined far in the past and was frequently driven by colonization and conquest, we treat legal heritage as exogenous to whether the country experienced a banking crisis recently. Moreover, a country's legal origin has a profound effect on the specific laws, regulations, and enforcement mechanisms that govern financial sector activities [LaPorta, Lopez-de-Silanes, Shleifer, and Vishny 1998]. Thus, we use an instrumental variable Probit estimator to gauge the causal impact of regulatory restrictiveness on banking sector fragility.

The Table 5 results indicate that simultaneity bias is not driving the positive relationship between restrictions on bank engaging in securities market activities and banking sector fragility. That is, when banks face greater restrictions on their ability to engage in securities market activities, banks have a higher probability of suffering a banking crisis. While the data provide less confident results on bank restrictiveness in general, the data are consistent with the view that lowering restrictions on the securities market activities of banks will boost, rather than jeopardize, banking sector stability.

The relationship between regulatory restrictions on the activities of banks and banking system crises, moreover, is economically quite large. The coefficient estimates suggest that a rise in restrictiveness by one -- that is, SECURITIES rises by one – produces an increase in the

[35] The instrumental variable estimator is analogous to the two-stage least squares, except that it must be appropriately modified to limited dependent variable framework. This is described in Maddala's (1983) textbook,

probability of a banking crisis by between 25 and 33 percentage points depending on the specific control variables included. This particular evaluation is based upon the mean values of the variables in the regression equation.[36] Thus, in addition to being statistically significant, the empirical results suggest that restricting the ability of banks to diversify their activities influences their fragility in an economically important manner.

The finding that restrictions on the securities activities of banks on average significantly ***increase*** the likelihood of banking sector fragility is consistent with evaluations of events during the Great Depression in the U. S. White (1983, 1986), for example, shows that banks that were engaged in investment banking activities during the 1930s were better diversified and thus less likely to fail than banks that were not involved in the securities market business.[37] Although more research surely is needed, these results suggest that even after controlling for many relevant features of national economies, allowing banks greater freedom to engage in securities activities reduces the likelihood of banking crises.

IV. Directions for Future Research

A more extensive dataset, both in terms of the variables included and the range of countries, will enable us to provide better information and thus better advice on appropriate regulatory reforms. For example, our finding that banks with more diversified powers are less likely to suffer a banking crisis may be sensitive to other components of the regulatory environment, which for now are omitted variables in our analysis. It may be that countries that allow broader powers to

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Limited Dependent and Qualitative Variables in Economics (New York: Cambridge University Press).

[36] Since the Probit technique is a nonlinear estimation procedure, the implied effect of a given change in SECURITIES on the probability of a crisis is nonlinear and depends on the precise characteristics of the individual country involved in the conceptual experiment.

[37] Note that in the U. S. in the period before the enactment of the Glass-Steagall Act, big banks were most likely to be involved in investment banking activities. This confounds some of White's (1983, 1986) analyses. In our study, however, we study the whole regulatory regime, which reduces this complication. Also, see Kroszner and Rajan

banks, for example, also have higher capital requirements or better supervision. Or it may be that they are the countries that have more foreign banks, who may well be better at risk management. One should also consider the organizational structure of banks that engage in wider range of activities. Whether the activities are conducted within bank itself or through subsidiaries or affiliates may matter. More generally, it seems increasingly clear that the new global and technological environment requires regulation and supervision that focuses on the performance of the financial system as a whole. One should therefore consider the extent to which regulations directed at one specific component of a country's financial system spill over to other components as well as to the financial systems of other country's. In any event, in order to increase the robustness of any policy recommendations, these types of extensions are important and will be the subject of future research.

(1994), and Rajan (1998).

Tables

Table 1

The Relationship Between Regulatory Restrictiveness and the Quality of Government /Bureaucratic Systems: Empirical Results

A. Correlations

	Restrict	Securities	Insurance	Real Estate	Nonfinancial Firm Ownership
Government	-0.436 {0.004}	-0.220 {0.140}	-0.207 {0.144}	-0.364 {0.037}	-0.449 {0.007}

B. Regressions

	Restrict	Securities	Insurance	Real Estate	Nonfinancial Firm Ownership
constant	3.778 *{0.006}*	0.977 *{0.579}*	7.468 *{0.000}*	3.622 *{0.052}*	2.323 *{0.322}*
Economic Development	-0.044 *{0.813}*	0.215 *{0.430}*	-0.638 *{0.020}*	0.047 *{0.853}*	0.317 *{0.379}*
Revolution & Coups	-1.009 *{0.001}*	-0.674 *{0.023}*	-0.840 *{0.014}*	-1.376 *{0.013}*	-1.420 *{0.011}*
Government	-0.156 *{0.008}*	-0.162 *{0.083}*	0.078 *{0.323}*	-0.206 *{0.008}*	-0.370 *{0.007}*
R-squared Prob(F-statistic)	0.33 0.00	0.12 0.17	0.18 0.05	0.23 0.01	0.29 0.00

Notes:

P-Values appear in brackets.

GOVERNMENT equals the average value of REDTAPE, CORRUPT and RULELAW.

RESTRICT equals the average value of SECURITIES, INSURANCE, REAL ESTATE, NONFINANCIAL FIRM OWNERSHIP.

Table 2

The Relationship Between Regulatory Restrictiveness and Banking Sector Development: Empirical Results

A. Correlations

	Private Credit	Overhead	Net Interest
Restrict	-0.37	0.24	0.31
	{0.008}	*{0.131}*	*{0.020}*
Securities	-0.21	0.24	0.21
	{0.169}	*{0.095}*	*{0.105}*
Insurance	-0.10	-0.06	-0.05
	{0.258}	*{0.869}*	*{0.908}*
Real Estate	-0.34	0.17	0.32
	{0.012}	*{0.153}*	*{0.009}*
Nonfinancial Firm Ownership	-0.41	0.33	0.38
	{0.017}	*{0.038}*	*{0.006}*

B. Regressions

	Private Credit	Overhead	Net Interest
constant	-58.44	-0.84	1.01
	{0.333}	*{0.898}*	*{0.827}*
Economic Development	15.44	0.16	-0.04
	{0.007}	*{0.802}*	*{0.921}*
Revolution & Coups	-14.47	2.91	1.62
	{0.195}	*{0.180}*	*{0.172}*
Restrict	-11.66	1.26	1.22
	{0.196}	*{0.106}*	*{0.023}*
R-squared	0.38	0.13	0.17
Prob(F-statistic)	*{0.000}*	*{0.152}*	*{0.066}*

Notes:
P-Values appear in brackets.

Table 3

The Relationship Between Banking Crises, Government/Bureaucratic Systems, and Regulatory Restrictiveness: Empirical Results

A. Correlations

	Government	Restrict	Securities	Insurance	Real Estate	Nonfinancial Firm Ownership
CRISIS	-0.37	0.30	0.39	-0.07	0.30	0.29
	{0.016}	*{0.047}*	*{0.009}*	*{0.872}*	*{0.065}*	*{0.089}*

B. Quartile Grouping by Government/Bureaucratic Systems

	Crisis	Restrict	Securities	Insurance	Real Estate	Nonfinancial Firm Ownership
Very Poor Government	0.62	2.33	1.82	2.73	2.58	2.18
Poor Government	0.33	2.12	1.80	2.20	2.80	1.67
Good Government	0.33	1.89	1.27	2.45	2.09	1.73
Very Good Government	0.17	1.98	1.58	2.17	2.25	1.92

C. Quartile Grouping by Regulatory Restrictiveness

	CRISIS	GOVERNMENT
Very Restrictive	0.63	5.92
Restrictive	0.56	5.19
Permissive	0.25	7.71
Very Permissive	0.25	7.68

Note: Crisis equals one when the estimated cost of a banking crisis is greater than 5 percent of GDP (18 countries), zero otherwise.

Table 4
Explaining the Likelihood of Banking Crises: Probit Regressions with Bank Securities Restrictions and Bank Composite Regulatory Restrictions
(Dependent variable: Crisis=1, No Crisis=0)

Other Explanatory Variables	Coefficient on Securities Activities Restrictions	Coefficient on Restrict
Constant	0.79 *{0.019}*	0.88 *{0.015}*
Constant, Government, Account	0.87 *{0.024}*	0.86 *{0.051}*
Constant, Government, Account, Creditor & Shareholder Rights	1.05 *{0.015}*	0.96 *{0.043}*
Constant, Government, Account, Creditor & Shareholder Rights, Private Credit, Initial Income, Growth	1.02 *{0.021}*	1.05 *{0.041}*

Notes

P-Values appear in brackets.

Crisis equals one when the estimated cost of a banking crisis is greater than 5 percent of GDP (18 countries), zero otherwise.

Table 5
Explaining the Likelihood of Banking Crises:
Instrumental Variable Probit Regressions
with Bank Securities Restrictions and
Bank Composite Regulatory Restrictions
(Dependent variable: Crisis=1, No Crisis=0)

Other Explanatory Variables	Coefficient on Securities Activities Restrictions	Coefficient on Restrict
Constant	0.86 *{0.014}*	0.52 *{0.117}*
Constant, Government, Account	1.04 *{0.010}*	0.84 *{0.056}*
Constant, Government, Account, Creditor & Shareholder Rights	1.24 *{0.008}*	1.05 *{0.035}*
Constant, Government, Account, Creditor & Shareholder Rights, Private Credit, Initial Income, Growth	1.24 *{0.013}*	1.48 *{0.027}*

Notes:

P-Values appear in brackets.
Crisis equals one when the estimated cost of a banking crisis is greater than 5 percent of GDP (18 countries), zero otherwise.
Legal origin variables (English, French, German, and Scandinavian) are used as instruments for regulatory restrictiveness variables. Other variables in the conditioning information set are treated as exogenous.

Appendix Table 1
Quantitative Measures of Regulatory Restrictiveness for Sample Countries

Country	Securities	Insurance	Real Estate	Nonfinancial Firm Ownership	Restrict
Argentina	3	2	2	3	2.50
Australia	1	2	3	2	2.00
Austria	1	2	1	1	1.25
Belgium	2	2	3	3	2.50
Brazil	2	2	3	3	2.50
Canada	2	2	2	3	2.25
Chile	2	3	4	4	3.25
Colombia	2	2	2	4	2.50
Denmark	1	2	2	2	1.75
Ecuador	2	4	4		3.33
Egypt, Arab Rep.	2	2	3	3	2.50
Finland	1	3	2	1	1.75
France	1	2	2	1	1.50
Germany	1	3	2	1	1.75
Greece	2	3	3	1	2.25
Hong Kong	1	2	2	3	2.00
India	2	4	3	3	3.00
Indonesia	2	4	4	4	3.50
Ireland	1	4	1	1	1.75
Israel	1	1	1	1	1.00
Italy	1	2	3	3	2.25
Japan	3	4	3	3	3.25
Korea	2	2	2	3	2.25
Malaysia	1	1	1	2	1.25
Mexico	2	2	3	4	2.75
Netherlands	1	2	2	1	1.50
New Zealand	2	2	2	1	1.75
Nigeria	1	2	2	2	1.75
Norway	2	2	2	2	2.00
Pakistan	2	4	3	2	2.75
Peru	2	4	3	4	3.25
Philippines	1	2	2	2	1.75
Portugal	1	2	3	2	2.00
Singapore	2	2	2	3	2.25
South Africa	1	2	3	2	2.00
Spain	1	2	3	1	1.75
Sri Lanka			1	1	1.00
Sweden	1	2	3	3	2.25
Switzerland	1	2	1	1	1.25
Thailand	2	2	2	3	2.25
Turkey	1	2	4	3	2.50
United Kingdom	1	2	1	1	1.25
United States	3	3	3	3	3.00
Uruguay	3	2	3	4	3.00
Venezuela	2	2	3	3	2.50

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